



ALL INDIA INSTITUTE OF SPEECH AND HEARING: MYSORE 570 006

Naimisham Campus, Mysore 570 006

Diploma in HA & ET Examination - April 2008

Time: 3 Hours

Max. Marks: 80

9.30 AM to 12.30 PM

DHE 1 - Hearing Aids

I. 1(a) A list of controls usually found in hearing aids is given below. 6

- i) Volume control ii) MPO iii) PC

Mention which type of variable resistor can be used to implement each of these control. Briefly explain how each of these variable resistors work

(b) Define capacitance. Explain how the capacitance effect can be utilized in a transducer which converts sound to electric signal. 4

OR

2 (a) Explain how an inductor works. Mention any two applications of inductors in hearing aids. 7

(b) Mention one application each of the following diodes

- 1) Zener Diode 2) Rectifier Diode 3) LED 3

3 (a) Which of the following amplifiers would you prefer in the 1st stage of a hearing aid circuit. Justify your answer.
i) Transistor based amplifier
ii) FET based amplifier 5

(b) With a neat sketch, explain the forward and reverse characteristics of a p-n junction diode 5

OR

4 (a) Which class of amplifier is suitable for the output stage of a hearing aid? Why? 6

(b) What is a filter? What are the different types of filters? Mention any one application of filters in hearing aids. 4

- 5 (a) Convert from decimal to binary
(I) 38 (ii) 64 , 4
- (b) Differentiate between Linear ICs and Digital ICs. Mention the names of two Linear ICs which are used in hearing aids. 6

OR

- 6 (a) List the different types of semi-conductor memories 4
- (b) Explain the working of the following gates and illustrate the inputs and outputs through a truth table.
- i) AND gate (ii) OR gate (iii) NAND gate 6

II. Answer **ANY SIX QUESTIONS** 6 x 5 = 30

1. What is the function of the following components in a hearing aid?
(i) Microphone (ii) Receiver (iii) Battery (iv) OTM switch
2. Explain the function of the following amplification stages in a hearing aid.
(i) Pre amplifier (ii) Second Stage amplifier (iii) Power amplifier
3. What are the advantages of using IC based amplifiers in hearing aids?
4. What is non-linear amplification? Why is it needed for hearing aids?
5. Write short notes on **ANY TWO** of the following:
(i) Compression Ratio (ii) AGC
(iii) Attack time (iv) Release time
6. With a diagram, illustrate how a two pin V cord is connected to two receivers.
7. With a block diagram, explain the working of a Digital hearing aid.

III. Answer **ALL QUESTIONS.** 10 x 2 = 20

- A. Show the set up used for programming a Digital hearing aid.
- B. Mention the advantages of using digital technology in hearing aids.
- C. A Body level hearing aid is giving intermittent output. Explain the sequence Which you would follow to repair this hearing aid.

- D. A BTE hearing aid is giving output at 'T' position, but does not give any output at 'M' position of the 'OTM switch'. Explain how you will troubleshoot this hearing aid?
- E. List the parameters for which electroacoustic evaluation of a hearing aid is performed.
- F. What do you mean by an Assistive Listening Device? Mention the function and application of any one "Assistive Listening Device" which you are familiar with.
- G. With a block diagram, explain how an induction loop system works.
- H. Draw the block diagram of a FM system and explain its working.
- I. Why do we require group hearing aid systems in the classrooms of hearing impaired children? What are the advantages they have over personal hearing aids?
- J. Illustrate with a neat sketch, how a hardwire system can be implemented in the classroom of hearing impaired children?



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DHE 2 - Earmolds

Instruction: Question No. III is compulsory.

I. 1 (a) With a neat block diagram, describe how sound is transmitted through the hearing aids. 8

(b) Describe the different types of hearing aids. 2

OR

2 (a) Enumerate the causes of hearing loss. 8

(b) Mention the various degrees of hearing loss. 2

3 (a) How do you measure hearing acuity? 8

(b) List and briefly describe the configuration of audiogram. 2

OR

4 (a) Write an essay on acoustic modification of the earmold. 8

(b) Briefly mention the physical variation in earmolds. 2

5 (a) Describe briefly the procedure for making acrylic earmolds. 8

(b) Compare the differences between hard mold and soft mold technology 2

OR

6 (a) Mention briefly on
i) Hydrocolloids / silicone
ii) Heat cure / Cold cure 8

(b) What are the properties of gypsum products? What is its use in the process of making earmold? 2

II. Answer ANY SIX QUESTIONS.

6 x 5 = 30

- i. Parameters of sound
- ii. Middle ear
- iii. Types of hearing loss
- iv. Audiogram
- v. Aural rehabilitation
- vi. Requirements for setting up of an earmold lab
- vii. Role of earmold technician

HI. Answer ALL QUESTIONS.

2 x 10 = 20

1. _____ & _____ are the transducers used in a hearing aid.
2. _____, _____, _____ & _____ are different transducers in an audiometer.
3. _____ & _____ are the modes of hearing aids.
4. _____, _____ & _____ are the types of hearing loss,
5. _____, _____ & _____ are the bones in the middle ear.
6. _____ & _____ are the properties of hydrocolloids.
7. _____, _____ & _____ are the options available in the earmolds to avoid feedback.
8. _____, _____, _____ & _____ are the equipment used in an earmold laboratory.
9. _____, _____ & _____ are used as dampers in earmolds.
10. Earplugs are used for _____ & _____.